

fires was at times very dense, and it gave an unnatural aspect to the sun and sky, dimmed visibility, and had a general depressing effect upon the people.

No windstorms occurred and no warnings were issued. Near the close of the month it became cooler and frost warnings, which were partially verified, were issued for eastern Oregon and southern Idaho.—*E. A. Beals, District Forecaster.*

NORTH-CENTRAL FORECAST DISTRICT.

Several storms passed over the Lake region during the month for which warnings were issued, but no destructive storms causing any serious amount of injury to traffic occurred. On the 9th storm warnings were issued for a storm which developed over the Missouri Valley; on the 19th for a storm then central over northern Illinois; on the 24th for a storm then central over Minnesota, and again on the 29th for high northeast winds. In addition to these warnings, advisory messages were sent on two or three occasions.

Frost warnings were sent to the cranberry-growing region of Wisconsin on two or three occasions.—*F. J. Walz, District Forecaster and Inspector.*

SOUTH PACIFIC FORECAST DISTRICT.

The season has been an unusual one in the southwestern portion of the United States. While a reasonable precipitation may be expected along the Mexican boundary during July, August, and September, averaging 6 inches in southeastern Arizona, 2 inches in northern Arizona, and about 0.6 of an inch in western Arizona, with variations depending upon the altitude of the mountains, it is quite unusual to have precipitation in excess of the above figures. In the year 1889, during July and August, the rainfall in southeastern California, Arizona, and probably northwestern Mexico was excessive. It is believed that the year 1871 was a year of excessive rainfall. The present season has been marked by an unusually large number of thunderstorms, cloudbursts, and subsequent washouts. During the months of July and August, 1889, the rainfall at Flagstaff, Ariz., for example, was 5.65 inches, while for the same period during the current year the rainfall was 12.29 inches. Transportation companies, particularly the Atchison, Topeka, and Santa Fe Railroad, and the Southern Pacific Company of Arizona, had great difficulty in operating, and at some points trains were stalled for a period of five days. No sooner was the roadbed repaired than another heavy rain would again wash it out.

The pressure distribution during this period will, doubtless, show, when charted, an extensive trough of low pressure, reaching from the Valley of the Colorado northeastward through Colorado and Wyoming.

The month was a quiet one, on the whole, in northern California, and also along the coast north of Point Conception. In the Sierra Nevada and in the mountains of southern California, thunderstorms occurred nearly every day during the month. There were no storm warnings issued. A thunderstorm occurred at San Francisco on August 24. No rain had previously fallen on this date for forty years. On the same date thunderstorms were reported generally in the Sacramento Valley.—*Alexander G. McAdie, Professor and District Forecaster.*

WEST GULF FORECAST DISTRICT.

August weather presented no unusual feature. No conditions appeared that called for special warnings.—*I. M. Cline, District Forecaster.*

ROCKY MOUNTAIN FORECAST DISTRICT.

Warnings were issued to points in Wyoming twenty-four

hours in advance of the frost that was general in that State on the morning of the 22d. Cool nights were common throughout the district, but the feature of the month was the unusually large number of local thunderstorms with heavy downpours or cloudbursts. These were confined principally to the mountain and foothills districts, and, while the increased water supply was of great value to irrigation interests in the Plains region, the benefits were offset by loss of property along the upper courses of the streams. The railroads in Arizona, northern New Mexico, and southern Colorado suffered serious interruptions to traffic and large pecuniary loss by the washing out of roadbeds and bridges. The cloudburst of the evening of the 7th caused a terrible loss of life by drowning in the flood that swept down an arroyo, 1 mile north of Eden, a station on the Denver and Rio Grande Railroad, 8 miles north of Pueblo. The bridge at this point, weakened by the flood that was sweeping down the valley, gave way under the weight of a train, dashing all but the sleeping cars into the torrent and drowning the occupants; of these the bodies of 89 were recovered. The bridge had an opening of 758 square feet for the draining of the watershed, which has an area not exceeding 12 square miles of rolling country, in which the maximum elevation is 300 feet. The volume that was emptied into Fountain Creek, near by, was not measured, but it was enormous, considering the small drainage area. At the Santa Fe Bridge, 1 mile to the westward, where the area drained is correspondingly smaller, the volume was about 8300 second-feet.—*F. H. Brandenburg, District Forecaster.*

RIVERS AND FLOODS.

During August the usual summer conditions of comparatively low water prevailed over the various watersheds of the country, except in the Southeastern States, where there were some decided rises due to heavy local rains. The stages reached, however, were not abnormal and, except along the watershed of the Alabama River, the results proved rather beneficial than otherwise, especially to the navigation interests. Warnings of the approaching waters were issued at opportune times, and they were well verified. Along the Tallapoosa, upper Coosa, and Alabama rivers the warnings were issued in ample time to allow the planters to throw up temporary levees across low places in the river banks, and they were thus enabled to keep out the flood waters that would otherwise have overflowed the grain and cotton fields in the lowlands. It is estimated that crops to the value of \$25,000 were saved as a result of the warnings, while the losses of those that could not be protected probably amounted to twice as much.

Along the upper Tennessee River timely rains during the first week of the month permitted the resumption of navigation on the 6th, and for two weeks after a sufficient supply of water for steamboat traffic was maintained by the aid of almost daily showers.

The highest and lowest water, mean stage, and monthly range at 213 river stations are given in Table VII. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Professor.*

CLIMATE AND CROP SERVICE.

By Mr. JAMES BERRY, Chief of Climate and Crop Service Division.

The following summaries relating to the general weather and crop conditions during August are furnished by the directors of the respective sections of the Climate and Crop Service of the Weather Bureau; they are based upon voluntary reports

from meteorological observers and crop correspondents, of whom there are about 3000 and 14,000, respectively:

Alabama.—Weather favorable for corn and minor crops, except too dry north and west, though cotton made fairly good progress in those

districts. Heavy to excessive rains in middle and southern counties caused cotton to deteriorate steadily from rust and shedding; some damage by bollworms and blackroot; early cotton opened freely, and picking active during last decade. Some lowland corn and cotton damaged by overflow; much early corn gathered, yield excellent; considerable fodder saved.—*F. P. Chaffee.*

Arizona.—Moderate temperatures and generally showery weather prevailed during August, and conditions were generally favorable for the rapid growth of vegetation. All growing crops made good progress during the month, corn, sorghum, and garden truck doing especially well. Alfalfa did well, but was very weedy in some localities. Grass on ranges grew rapidly, and at the end of the month was in very fine condition, promising abundant winter feed. Stock water was plentiful and stock improved rapidly.—*M. E. Blystone.*

Arkansas.—Temperature and rainfall were slightly deficient. Cotton began fruiting nicely, but dry weather last of month caused shedding and the crop deteriorated rapidly; some was opening by the close of the month, but no picking was done. Early corn made good crop; the late suffered from lack of moisture and promises short crop. Thrashing was practically completed; good yields of fair quality were secured. Apples and peaches continued dropping and promise fair crops of medium quality.—*Edward B. Richards.*

California.—Numerous thunderstorms and cloudbursts occurred during the month in the mountain districts, principally in southern California, and some damage was done to railroads, irrigating ditches, etc. High winds also damaged buildings and orchards to some extent. The heavy rains in the mountains will prove of great value to agricultural interests. The few days of extremely hot weather caused rapid ripening of grapes and late fruits, and but little injury to the grape crop. Raisin making is in progress.—*G. H. Willson.*

Colorado.—Month favorable, but showers interfered with haying. Harvesting of grain, native hay, and second crop of alfalfa practically finished. Thrashing under way, with generally good yields, but spring wheat poor, on account of rust; fall plowing begun, and some wheat sown in Arkansas Valley. Beets, potatoes, corn, and alfalfa made good growth; in some localities corn already beyond danger of frost. Fine crops of apples, peaches, pears, plums, melons, and cantaloupes marketed; prospects for late fruit excellent.—*F. H. Brandenburg.*

Florida.—Previous dry weather, followed by frequent rains over the cotton counties, caused a decided falling off in the condition of that staple, and at the close of the month the resulting damage was very apparent. Corn promised better than expected earlier in the season. Cane and sweet potatoes made fair progress. Pineapple slips improved greatly with the more frequent rains. Growing vegetation was making fair progress at the close of the month.—*R. T. Lindley.*

Georgia.—During the first half of the month cotton was damaged by too much rain; shedding, rust, and blackroot increased, and too much weed developed; the second half was very favorable and caused a decided improvement; much of the early crop in central and southern sections opened and picking became general. One of the largest corn crops in years was made secure by the favorable weather conditions. Much hay and fodder was saved. All minor crops prospered.—*J. B. Murbury.*

Idaho.—The weather was excessively warm till about the 18th, becoming much cooler after that date; the climax of the cool period was about the 21st and 22d, when frosts were general. Precipitation was deficient in northern and some central districts, resulting in a shortage in the grain and hay crops; elsewhere these crops were yielding well. Fruit was good. Melons were abundant. Sugar beets promised satisfactory returns. Potatoes were below average.—*Edward L. Wells.*

Illinois.—General rainfall the latter part of the second decade relieved pronounced droughty conditions that had seriously affected the corn crop over a considerable area; grasses also had suffered. At the end of the month a decided improvement in growing vegetation was noted. Thrashing operations continued, with few interruptions, and were nearing completion by the 31st. The month closed with favorable outlook for potatoes, plums, and grapes, but apples were generally disappointing.—*William G. Burns.*

Indiana.—The month was cool, and damaging drought prevailed to the 18th. Thrashing wheat and harvesting oats and timothy were completed early in the month; wheat yield light; oats and timothy fairly good. Corn suffered from drought, and about the 20th much was blown down; most of it raised, however, and a fair crop was in prospect. Potatoes fairly promising. Tobacco prospects poor. Apples defective and crop light. Pear crop fairly promising. Grapes and plums abundant. Clover and pastures in good condition and fall plowing well advanced.—*W. T. Blythe.*

Iowa.—Though the nights were unseasonably cool, the days were mostly bright and warm, and as a whole the month was favorable for advancement of immature crops and for stacking grain, thrashing, fall plowing, and harvesting wild hay. The corn crop became unusually rank and heavily eared, and though belated gave promise of an average yield. Large crops of early potatoes and fall apples were matured; minor crops made fair yields, and pasturage was abundant.—*John R. Sage.*

Kansas.—By the close of the month early corn was being cut in the south, and was maturing in the central and northern counties. Late corn grew rapidly and in the southern counties was practically made.

Prairie haying was general and a large crop was saved. Apples were plentiful in many counties, but were falling badly in others. Cutting the third crop of alfalfa began the third week and a good crop was generally secured. Potatoes made a good crop. Peaches and grapes were ripe and abundant. Thrashing continued. Plowing for fall seeding was in progress.—*T. B. Jennings.*

Kentucky.—The temperature averaged a little below the normal for the month. The rainfall was a little less than normal, but it was unevenly distributed, some localities having abundant rain while others suffered at times from drought. Corn did well generally, but in some localities it was injured by drought. Tobacco made fairly good growth and was generally in good condition. Fruit deteriorated, apples dropping badly. Pastures, meadows, and gardens needed more rain.—*H. B. Hersey.*

Louisiana.—Frequent showers first half of month followed by two weeks of hot, dry weather proved unfavorable for cotton. More or less shedding was reported and bollworms and caterpillars did some damage. Mexican boll weevil was found in eight localities along the western border of the State, but damage was reported from only a few places. Hot, showery weather caused sugar cane to develop rapidly. Rice harvest was interfered with by showers early in the month, but later the crop was housed as rapidly as possible. Corn was maturing at the close of the month. Fall gardens made good growth. Hay making progressed satisfactorily.—*J. M. Cline.*

Maryland and Delaware.—Rainfall was generally ample until last decade. Thrashing was almost completed. Early corn matured a good crop, late damaged by drought. Much fine fodder secured in southern counties. Tobacco mostly housed and cured splendidly, late crop reduced by dry weather. Fruit fair, except apples, which were scarce. Sugar corn very fine, tomatoes fair. Potatoes abundant and good. Plowing was well advanced first half of month, but preparations for seeding were delayed by drought during the last decade.—*H. B. Wren.*

Michigan.—Temperature uniformly cool and precipitation unevenly distributed. Harvest scarcely interrupted. Corn made slow and generally healthy growth and eared well. Oats were mostly secured during first decade. Drought in late July and early August shortened yields of peas and early beans. Late potatoes, sugar beets, late beans, buckwheat, apples, plums, and grapes continued promising. Pastures were poor until 20th, when they were slightly improved. Plowing became general during second decade; during last decade rye seeding began in the southern counties.—*C. F. Schneider.*

Minnesota.—Spring wheat cutting began on 4th in south, advancing northward with cutting of barley and oats, and all harvest nearly finished by 30th. Rust attacked western and northern wheat, with considerable injury. Stacking, shock thrashing, and flax cutting began about 15th. Corn improved most of month. Potatoes ripening at end of month. Very light frosts in south on 8th. Loss of life and great damage by storm, Renville to Washington counties, on 20th. Plowing begun.—*T. S. Outram.*

Mississippi.—Owing to heavy rains the first half of the month, cotton grew too rapidly to fruit well on lowlands, but was very satisfactory on uplands. The rather abrupt change to hot, dry weather about the middle of the month generally caused cotton to blight and shed seriously, except in a few localities where there was sufficient moisture. A fine crop of early corn matured and much fodder and hay were saved. Late corn, pastures, and minor crops were promising.—*S. D. Flora.*

Missouri.—During the first fifteen days of August corn suffered to some extent from drought, and a small part of the crop was permanently damaged. Copious rains fell on 17-20th over the entire State, however, followed by decided improvement in all growing crops. The advanced part of the crop was out of danger of frost, cutting being in progress in localities. Thrashing was completed; wheat yields were disappointing. Plowing for fall seeding began during the latter part of the month.—*George Reeder.*

Montana.—High temperatures during the greater part of the month caused rapid growth of all irrigated crops. Drought prevailed until near the close of the month, causing serious deterioration in ranges and unirrigated crops in nearly all sections. Wheat harvest began early in the month and continued to its close. Weather favorable for haying, which was carried on throughout the month. Scarcity of stock water caused suffering among cattle and sheep on the northern ranges the latter half.—*R. F. Young.*

Nebraska.—Harvesting was completed early in August. Stacking and shock thrashing progressed rapidly and were practically finished soon after the middle of the month, with much less damage than usual from unfavorable weather. An excellent crop of hay was being secured the last half of the month. Corn made satisfactory progress toward maturity and was generally promising, but dry weather in southern counties caused slight deterioration.—*G. A. Loveland.*

Nevada.—The month was favorable for the growth and development of all crops. The harvesting of hay and grain progressed nicely, with better than average yields in most districts. Frequent cloudbursts in eastern and southwestern sections the latter part of month did considerable damage to crops, country roads, railroad tracks, and canyon ranches. Potatoes and other vegetable crops made good progress. Range feed was fairly good and stock of all kinds did well. Irrigation water was generally plentiful throughout the month.—*J. H. Smith.*

New England.—The month was cool, with much sunshine. During the last four days light frosts occurred quite generally in northern interior districts, but caused no appreciable injury. The rainfall was slightly above normal, but as little fell after the 20th the month closed with a general need of rain. Favorable conditions prevailed for the maturing and harvesting of crops. An abundant crop of apples of excellent quality seemed assured. Potatoes promised average yield, although there was considerable rot locally. An excellent crop of tobacco was secured.—*T. L. Bridges.*

New Jersey.—The month was chiefly noted for its unequally distributed rainfall, that came in the form of remarkably heavy local thunderstorms over limited areas of all sections. Hot, sultry days were few and the number of clear and fair days unusually large. At the close of the month all crops were well advanced toward maturity, except in the southern section, where late tomatoes, potatoes, and other truck crops were suffering from the long absence of rain.—*Edward W. McGinn.*

New Mexico.—Showers were well distributed and water holes and lakes on mesa lands were filled. Heavy rains fell in mountain districts, increasing the flow in streams and irrigating ditches. Under the favorable conditions gardens were revived, stock improved rapidly, and grass on ranges made excellent growth and greatly increased the prospects for winter feed. At close of month harvesting of wheat, oats, and alfalfa was under way and hay of good quality was being stacked.—*J. B. Sloan.*

New York.—Temperature during first eight days favorable, but local showers hindered the harvest; remainder of month generally too cool, and frosts occurred in colder sections on the 9th, 19th, 24th, 27th, and 29th; latter half of month generally too dry. Corn gained rapidly, but was very backward; potatoes suffered from blight and rot, but promised a large yield; beans damaged by rust; large yields of oats and barley; pastures and milk supply declined rapidly; tobacco, hops, and buckwheat fine; large crop of good apples and plenty of grapes promised; some wheat sown.—*R. G. Allen.*

North Carolina.—First twelve days showery, followed by clearer weather, which was very favorable for minor crops and farm work, but came too late to prevent a marked deterioration in cotton, through shedding. Corn was generally maturing well, and a fine crop was nearly assured. Tobacco leaves were curing nicely, but the crop was rather short. Peanuts were doing well. Turnips, rutabagas, and fall potatoes were generally up before the close of the month. Fruit was turning out poorly.—*A. Wiesner.*

North Dakota.—The month was cooler than usual, and while favorable for filling small grain, was unfavorable for growth of corn and flax, which were in a very unsatisfactory condition. Harvest of early grain continued after the first week with only slight interruption by occasional rainstorms, except in the northeastern section, where heavy rains not only delayed harvesting, but did considerable damage to crops.—*B. H. Bronson.*

Ohio.—The month was generally too cool for the best growth of crops; light frost occurred in northern counties during the latter part. The wheat yield was indifferent and of poor quality; oats large yield; buckwheat promising. Cutting of field corn began the last of the month, condition fair. Potatoes promising. Tobacco promised fair yield and cutting was in progress. Pears were good. A large crop of plums was secured. Grapes were good. Peaches fair on high ground.—*J. Warren Smith.*

Oklahoma and Indian Territories.—Cool weather and excessive precipitation prevailed. Wheat thrashing was about completed with poor to fair yields. Early corn secured with fair to good yields, late injured by dry weather in some localities. Cotton made good growth, some opening and being picked; some damage by bollworms and shedding. Kafir and broom corn, cane, millet, milo maze, hay, and castor beans were being secured with good yields and quality. Late potatoes did well. Fruit generally gave light yields.—*C. M. Strong.*

Oregon.—August was extremely dry in all sections of the State and vegetation in general made little advancement. Light scattering showers occurred in the western section on the 27th and 28th, but the amount was insufficient to be of much benefit, except to clear the atmosphere of smoke, which had become dense and oppressive. Fall grain harvest was practically completed and thrashing was general by the second decade. Fall wheat gave excellent results.—*Edward A. Beals.*

Pennsylvania.—Month closed with pastures and soil in fine condition and plowing well under way. Wheat crop satisfactory in most districts; oats yielding heavily. Tobacco being cut and returns favorable. Buckwheat filling nicely and early sown ripening. Early corn earing well, but late needing higher temperature to insure maturity. Potato crop good in most districts. Peaches on highlands better than expected. Winter apples developing nicely; other fruits and vegetables plentiful and of excellent quality.—*T. F. Townsend.*

Porto Rico.—Local showers the first three weeks in the northern section and moderate showers the last week throughout the island. Most crops suffered little damage from the drought or the heavy showers. Cane continued in good condition, giving promise of a fine crop. The yield of coffee was small, but of good quality. Cotton proved a very satisfactory crop and an increased acreage will be planted. Rice did poorly. Small crops and fruits were abundant and of good quality, and pastures remained in fair condition.—*M. A. Robinson.*

South Carolina.—Precipitation excessive, but harmful over small areas

only. Temperatures were generally favorable, although too low during the last week. Crops developed rapidly and favorably, except cotton on light soils, on which rust and blight developed extensively, causing shedding; some bolls opened, and picking was begun in southern portions. Early corn ripened and late became very promising. The weather was favorable for rice, sweet potatoes, sugar cane, and minor crops generally. Much fall truck was planted.—*J. W. Bauer.*

South Dakota.—Conditions were favorable for harvesting of small grains, haying, stacking, and thrashing, though rains temporarily interrupted. Harvesting was finished and flax cutting begun in the third decade. Wheat, except macaroni, suffered serious damage from rust, but other grains, potatoes, flax, and hay were good. Corn was injured by drought in some western localities; elsewhere, though backward, advanced fairly well. Pasturage was mostly good. Hail and wind in northeastern counties on the 20th damaged crops locally.—*S. W. Glenn.*

Tennessee.—Except in the eastern division, the rainfall was much below the normal, and in many localities crops, especially late corn and cotton, suffered from drought. Tobacco ripened well, as a rule, and cutting was in progress during the last week of the month. Early corn was generally excellent. Seed clover was in good condition. Cotton was damaged considerably by rust and shedding. Plowing for fall seeding progressed well, except in the dry districts, where it was greatly delayed.—*H. C. Bate.*

Texas.—Good showers were general over the State on the 6th and 7th and daily showers occurred over the southeastern portion during the second week. Good showers also occurred over the northwestern portion during the week ending with the 22d, but at that time the northeastern and middle-western counties began to suffer from drought, and the greater portion of the State was suffering from this cause at the close of the month. High temperatures during the last decade were also detrimental. The cotton crop was in good condition at the beginning of the month, but deteriorated rapidly as a result of continued showers in the southeastern portion during the first half of the month, drought over the northern two-thirds of the State during the last decade, damage by boll weevils in the southwestern, coast, central, eastern, and a number of northern counties, and damage by bollworms in all sections. The bolls opened rapidly after the 15th and picking was general the last few days of the month. Late corn was badly damaged by drought. Rice did fairly well and was being harvested the last of the month. Sugar cane made good growth.—*L. H. Murdock.*

Utah.—Thunderstorms were frequent during the month. Severe frosts on the 21st and 22d seriously damaged lucerne seed, potatoes, and other vegetables. Farm work was delayed by rains, but harvesting and thrashing were nearly completed, with yields above average. Beets were maturing rapidly and the crop was in splendid condition. Fruit and garden truck were good and plentiful. Ranges were fine and stock was thriving. The supply of irrigation water was amply sufficient to carry all crops to maturity.—*R. J. Hyatt.*

Virginia.—The month was generally favorable for the maturity of outstanding crops. The temperatures were moderate, for the most part, and while the rainfall was below normal, its distribution both as to area and time of occurrence kept vegetation from suffering. Wheat was thrashed and spring oats were harvested. Corn kept in a very thrifty condition all the month and tobacco made excellent progress. Considerable fall plowing was done.—*Edward A. Evans.*

Washington.—Ideal weather prevailed throughout the month for harvesting and thrashing, but it was too dry for gardens, potatoes, and pastures. A fine crop of winter wheat was harvested and thrashed. The spring wheat crop, owing to drought and hot winds, was below the average yield except in the most favorable localities of the eastern and southeastern counties. The oat crop was lighter than average. Potatoes promised only a half crop; hops a fair to good crop.—*G. N. Salisbury.*

West Virginia.—Harvesting was practically completed during August, the weather generally being favorable. Good crops of hay and oats were secured in good condition. Corn made fairly good growth, except over the western-central counties, where drought prevailed. Millet was rather light in some parts. Cowpeas and buckwheat did very well. Light rains started meadows and pastures during the third week. At the close of the month the prospects were for a fair crop of peaches, about a half crop of apples, and a large crop of plums and grapes.—*E. C. Vose.*

Wisconsin.—Killing frost occurred in central and western counties on the 8th, more than a month earlier than the average date. Corn, buckwheat, and gardens were injured to some extent in exposed localities, and the cranberry crop in Wood, Jackson, and Monroe counties was severely damaged, the loss being estimated at about 50 per cent of the crop. The temperature on the marshes was generally from 4° to 6° below the freezing point, and ice formed in many localities. Corn and tobacco grew very slowly on account of the cool weather.—*W. M. Wilson.*

Wyoming.—The month was favorable for crop development and completion of haying. The cool spell from the 20th to 22d damaged tender crops in many sections, especially over the western half. Most of the native hay crop was secured by the middle of the month, and by its close the second crop of alfalfa had been secured generally. A good crop of grain was secured where frosts of the summer had not been too severe. Ranges cured in excellent condition. All stock in excellent condition.—*W. S. Palmer.*

SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS, AUGUST, 1904.

In the following table are given, for the various sections of the Climate and Crop Service of the Weather Bureau, the average temperature and rainfall, the stations reporting the highest and lowest temperatures with dates of occurrence, the stations reporting greatest and least monthly precipitation, and other data, as indicated by the several headings.

The mean temperatures for each section, the highest and

lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperature and precipitation are based only on records from stations that have ten or more years of observation. Of course the number of such records is smaller than the total number of stations.

Section.	Temperature—in degrees Fahrenheit.								Precipitation—in inches and hundredths.					
	Section average.	Departure from the normal.	Monthly extremes.						Section average.	Departure from the normal.	Greatest monthly.		Least monthly.	
			Station.	Highest.	Date.	Station.	Lowest.	Date.			Station.	Amount.	Station.	Amount.
Alabama.....	78.4	- 1.2	Newbern.....	101	24	Maple Grove, River- ton, Valley head, Anniston.....	55 55 55	27 28 29	5.55	+1.11	Goodwater.....	13.17	Florence.....	1.38
Arizona.....	79.7	- 0.3	Fort Mohave.....	118	5	Flagstaff.....	46	30	3.60	+1.34	Huachuca Reservoir.	9.00	Fort Mohave.....	0.38
Arkansas.....	78.1	- 1.1	Newport.....	105	25	Fort Defiance.....	46	21, 22	2.77	-0.59	Helena, No. 2.....	6.40	Oseola.....	0.33
California.....	73.9	+ 0.2	Mammoth Tank.....	114	6	Oregon.....	46	27	2.77	-0.59	Laguna Valley.....	6.95	42 stations.....	0.00
Colorado.....	63.7	- 1.5	Volcano Springs.....	114	10	Bodie.....	24	30	0.17	+0.10	Longs Peak (near)	6.50	Las Animas.....	0.00
Florida.....	80.1	- 1.1	Blaine.....	103	29	Halls Gulch.....	21	22	2.43	+0.44	Sumner.....	17.46	Malabar.....	2.53
Georgia.....	77.6	- 1.4	Clermont.....	101	19	Monticello.....	61	5, 6	7.40	-0.13	Albany.....	14.33	St. Marys.....	2.34
Idaho.....	67.8	- 3.0	Westpoint.....	101	23	Diamond.....	54	28	7.33	+1.44	Chesterfield.....	1.78	Garnet.....	T.
Illinois.....	70.7	- 3.0	Garnet.....	110	15	Chesterfield.....	21	22	0.42	+1.04	Aledo.....	7.58	Olney.....	1.76
Indiana.....	71.1	- 2.1	Equality.....	98	14, 25	Lanark.....	37	8	4.12	-0.82	Syracuse.....	6.79	Cambridge City.....	0.87
Iowa.....	69.1	- 2.7	Rome.....	101	14	(Auburn, Syracuse, Topeka, Ft. Wayne, Bluffton, Northfield)	42 42 42	8, 9 27 27	2.45	-0.82	Fort Dodge.....	6.75	Sibley.....	0.66
Kansas.....	74.6	- 2.6	Mount Ayr, Waukec. Jetmore.....	97 104	13 28	Earlham.....	35	8	3.43	0.00	Sedan.....	9.27	Chapman.....	1.06
Kentucky.....	75.2	- 0.9	Ness City.....	104	13	Hanover.....	38	26	3.35	+0.07	Mount Sterling.....	5.52	Scott.....	0.59
Louisiana.....	80.2	- 1.2	Cadiz.....	100	14	Beavertown.....	45	27	2.64	-0.13	Port Eads.....	13.31	Caspiana.....	1.66
Maryland and Delaware.	71.9	- 1.9	Libertyhill.....	102	24	Plain Dealing.....	53	28	5.19	-0.29	Darlington, Md.....	8.74	Jewell, Md.....	0.69
Michigan.....	63.5	- 2.5	Boettcherville, Md. Hancock, Md.....	97 97	25 25	Deer Park, Md.....	31	27, 31	2.91	-0.70	Petosky.....	7.95	Lapeer.....	1.05
Minnesota.....	64.9	- 2.5	Arbela.....	91	14	Oakland, Md.....	31	27	2.91	-0.70	St. Cloud.....	6.00	Moorhead.....	0.96
Mississippi.....	79.4	- 0.8	Beardsley.....	98	12	Wetmore.....	25	10	2.81	+0.34	Pecan, (Swartwout).	14.18	Doniphan.....	1.98
Missouri.....	73.7	- 2.2	Laurel.....	102	24	Omer.....	25	30	3.05	-0.26	Maryville.....	9.51	Lamedeer.....	T.
Montana.....	65.1	- 0.2	Warrensburg.....	100	15	Pokagona Falls.....	27	29	2.77	-0.26	Columbia Falls.....	1.82	Gering.....	0.54
Nebraska.....	70.9	- 1.7	Springbrook.....	111	10	Austin, Hernando.....	56	27	4.07	-0.37	Grand Island.....	6.83	2 stations.....	0.00
Nevada.....	68.6	- 1.2	Kirkwood.....	104	14	Monroe City.....	43	23	5.46	+2.31	Cornwall, Vt.....	1.95	Cape May.....	2.65
New England*.....	65.3	- 2.5	Sudaville.....	105	7	Grayling.....	17	22	0.64	-0.21	College Farm.....	13.01	Fruitland.....	0.06
New Jersey.....	70.8	- 1.7	Nashua, N. H.....	93	1	Brokenbow, Hay Springs, Kennedy.....	36 36	22 22	2.80	-0.02	Fort Wingate.....	5.65	Otto.....	1.63
New Mexico.....	70.6	- 0.9	Indian Mills, Bridge- ton, Vineland.....	92 92	1 1, 7	Tecoma.....	22	20, 21	1.81	+1.33	Oyster Bay.....	10.60	Indianola.....	3.00
New York.....	65.6	- 1.5	Alamogordo, San Marcial.....	103 103	1 1	Vanceboro, Me.....	30	30	4.30	+0.25	Monroe.....	11.89	Melville.....	0.20
North Carolina.....	75.1	- 1.0	Berlin, Chatham.....	94	1	Layton.....	37	27	6.62	+2.14	Cando.....	5.37	Cincinnati.....	0.41
North Dakota.....	63.3	- 2.0	Selma.....	100	21	Charlotteburg.....	37	24	2.45	-0.11	Whiteagle, Okla.....	7.58	Goodwater, Ind. T.....	0.50
Ohio.....	68.8	- 2.8	Dickinson.....	102	2	Winners.....	39	12	2.24	+0.04	Warmspring.....	1.95	13 stations.....	0.00
Oklahoma and Indian Territories.....	79.0	- 2.2	Camp Dennison.....	97	25	Indian Lake.....	28	30	3.96	-0.11	Easton.....	9.64	Everett.....	1.66
Oregon.....	67.3	+ 1.5	Hobart, Okla.....	107	29	Livville.....	40	28	6.24	+0.41	Cidra.....	20.01	Coamo.....	0.94
Pennsylvania.....	68.0	- 1.8	Blalock.....	110	5	McKinney.....	31	2	1.67	-0.21	Effingham.....	13.43	Aiken.....	3.92
Porto Rico.....	79.1	Lock Haven.....	96	1	Green Hill, Orange- ville.....	38	27	2.74	-0.11	Tyndall.....	5.37	Oelrichs.....	T.
South Carolina.....	77.6	- 1.7	Cavey.....	98	23	Fairland, Vinita, Ind. T., Grand, Okla. (Beula, Wallowa.....	52 52 29	27 26 21	3.01 +0.96	0.21	Grace.....	7.50	Lebanon.....	1.04
South Dakota.....	68.8	- 1.6	Sumter.....	102	22	Pine.....	29	22	0.21	-0.39	Hearne.....	6.36	2 stations.....	0.00
Tennessee.....	76.0	0.0	Herried.....	105	3	Riverside.....	29	20	4.36	+0.33	Monticello.....	3.91	2 stations.....	0.00
Texas.....	81.0	- 1.2	Dover, Lewisburg, Pope.....	101 101	25 25, 31	Grampian, Pocomo Lake.....	34	27	4.36	+0.33	Coupeville.....	1.13	6 stations.....	0.00
Utah.....	63.4	- 0.9	Brownwood.....	109	29	Adjuntas.....	54	30	8.01	Beverly.....	6.71	Cuba.....	0.67
Virginia.....	72.8	- 1.6	St. George.....	104	5, 6	Cheraw, Greenville.....	54	28	8.47	+2.17	Butternut.....	6.56	Menasha.....	0.59
Washington.....	66.2	- 0.2	Rockville.....	104	6	Ramsey.....	30	22	2.19	-0.20	Phillips.....	3.11	Lusk.....	0.05
West Virginia.....	70.7	- 1.3	Hite.....	104	14	Dickson.....	47	27	3.00	-0.87				
Wisconsin.....	64.6	- 3.2	Stevens City.....	96	22	Texarkana.....	52	29	2.25	0.00				
Wyoming.....	63.0	- 0.6	Kennewick.....	112	5	Bonham, Graham.....	52	30	2.25	0.00				
			Martinsburg.....	95	1	Soldier Summit.....	22	22	1.06	0.00				
			Moorefield.....	95	25	Burkes Garden, Me- dowell.....	38	28	3.37	-0.86				
			Prairie du Chien.....	95	12	Cle Elum.....	30	24	0.30	-0.36				
			Fort Laramie.....	100	14	Cusick, Northport.....	30	21	0.30	-0.36				
						Bayard.....	32	27	2.88	-1.09				
						Agr. Exp. Station (near Grand Rapids)	26	8	2.90	-0.04				
						Daniel.....	17	22	1.16	-0.06				

* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut.

SPECIAL ARTICLES.

LOCAL STORM AT ST. LOUIS, MO., AUGUST 19, 1904.

By L. H. DAINGERFIELD, Observer Weather Bureau.

General conditions.—A well-defined storm area was central over northeastern Kansas and southeastern Nebraska on the morning of August 19, the lowest pressure being 29.70 inches at Concordia, Kans., and Omaha, Nebr. An almost ideal cyclonic circulation was evident around the center of the low area, and rain was falling from Iowa and Missouri eastward to

Ohio. St. Louis, in the southeastern quadrant of the depression, was favorably located for the visit of severe local storms. By 8 p. m. the storm center had moved eastward to southeastern Iowa, where the pressure had fallen to 29.60 inches, and by 8 a. m., August 20, the center of the disturbance was over the lower Lakes, the lowest pressure being 29.58 inches at Buffalo, N. Y., showing a constant increase in movement and intensity.